

## CROSSING TECHNIQUE IN COWPEAS

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### INTRODUCTION

A plant variety with all desirable characteristics is seldom found by direct selection from existing germplasm. It is often necessary to cross two or more varieties in order to combine several characteristics in one variety. Techniques of crossing usually consist of removing the anther before pollination, collecting pollens from male parent and finally transferring pollen to the stigma of the emasculated flower. For successful crossing, time of emasculation, method of pollination, and pollen viability are to be investigated for each crop.

There are a few reports dealing with such problems in beans *Phaseolus vulgaris* L. (2,3), and mung-beans *Phaseolus aureus* (1). However, there are no reports concerning crossing techniques in cowpeas (*Vigna sinensis* L.).

In an attempt to cross four cowpea varieties, namely, Egypt 183950, Climax, Iran 293420 and BK crowder; buds at different development stages were used. Following emasculation, buds were pollinated at varying intervals. Many such attempts failed and only a few succeeded. In this paper, only the latter cases are discussed. The experiment was performed at Bajgah Experiment Station from mid-July to the end of August 1970.

### METHOD OF CROSSING

#### a. Flower Description

The structure of the cowpea flower is similar to most legume flowers. The flowers usually open in early morning (6 A.M.), and in nearly all cases, they are already self-pollinated at this stage (Cleistogamous).

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**b. Emasculation**

It was found that the largest buds which were going to open the next morning were most suitable for emasculation. A good sign for detecting these buds was that the stylar hairs were erect at this stage when the buds were opened, whereas in less mature buds they were not erect. In these buds, pollens were not mature, whereas stigmas were receptive (Protogynous).

The flower bud which was to be emasculated was held in the left hand between thumb and forefinger. With a pair of forceps in the right hand, the standard and wings were opened, but not removed. Then, the upper part of keels and later the ten stamens were carefully removed. It was found that buds which were emasculated in early morning were most suitable for pollination.

**c. Pollen Source and Pollination**

Those flowers which had opened the same morning were a good source of viable pollen for pollination. Flowers which had been long exposed to direct sunlight, proved to be useless as pollen source. The flower which was used as pollen source, was detached and its reproductive parts which were still hidden inside keels, were rubbed directly to stigma of emasculated flower. Highest seed set was obtained when pollination followed immediately or a few hours after emasculation. It is important to note that emasculated flowers which were pollinated the day after emasculation did not set any pods.

**d. Management**

To protect the individual plants from insects and unwanted pollinations, pods were isolated by means of cheese-cloth bags supported by an iron tripod. To avoid mistakes and contamination, everyday, prior to emasculation and crossing, self-pollinated flowers were removed from each plant. And, to prevent possible mistakes in crossing genotypes, only one kind of crossing was performed on each individual plant.

**LITERATURE CITED**

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